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Docket No.: 12810-00319-US  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Jens Scheidel et al.

Application Serial No.: 10/586,007

Confirmation No.: 9441

Filed: July 12, 2006

Art Unit: 1626

For: METHOD FOR PRODUCING 3-  
PENTENENITRILE

Examiner: Not Yet Assigned

**NOTICE**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In accordance with applicants' duty to disclose attached is a copy of the International Preliminary Report on Patentability of the PCT counterpart for the above case. It is noted that the document cited has already been made of record in an Information Disclosure Statement in this application.

Respectfully submitted,

By Harold Pezzner

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From the INTERNATIONAL BUREAU

US-Conn.

**PCT**

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rules 44bis.3(c) and 72.2)

To:

BASF AKTIENGESELLSCHAFT  
67056 Ludwigshafen  
ALLEMAGNE



AST/V

Date of mailing (day/month/year)

01 February 2007 (01.02.2007)

Applicant's or agent's file reference

0000055298

**IMPORTANT NOTIFICATION**

International application No.

PCT/EP2005/000774 ✓

International filing date (day/month/year)

27 January 2005 (27.01.2005)

Applicant

BASF AKTIENGESELLSCHAFT et al

**1. Transmittal of the translation to the applicant.**

The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

**2. Transmittal of the copy of the translation to the designated or elected Offices.**

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

KR

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

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**3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).**

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

Phase beendet 27.06.06

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

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G.40

**TRANSLATION**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>0000055298</b>	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. <b>PCT/EP2005/000774</b>	International filing date (day/month/year) <b>27.01.2005</b>	Priority date (day/month/year) <b>29.01.2004</b>
International Patent Classification (IPC) or national classification and IPC <b>C07C253/10</b>		
Applicant <b>BASF AKTIENGESELLSCHAFT</b>		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>2</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																									
<p>4. This report contains indications relating to the following items:</p> <table><tr><td><input checked="" type="checkbox"/></td><td>Box No. I</td><td>Basis of the report</td></tr><tr><td><input type="checkbox"/></td><td>Box No. II</td><td>Priority</td></tr><tr><td><input type="checkbox"/></td><td>Box No. III</td><td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td><input type="checkbox"/></td><td>Box No. IV</td><td>Lack of unity of invention</td></tr><tr><td><input checked="" type="checkbox"/></td><td>Box No. V</td><td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VI</td><td>Certain documents cited</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VII</td><td>Certain defects in the international application</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VIII</td><td>Certain observations on the international application</td></tr></table>		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
Date of submission of the demand	Date of completion of this report																								
Name and mailing address of the IPEA/EP	Authorized officer																								
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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2005/000774

Box No. I

Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-41 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1-9 \_\_\_\_\_ received by this Authority on 28.11.2005 with letter
- nos.\* \_\_\_\_\_ received by this Authority on of 22.11.2005
- ☒ the drawings:
- sheets 1/6-6/6 \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2005/000774

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

## 1. Statement

Novelty (N)

Claims 1-9

YES

Claims

NO

Inventive step (IS)

Claims 1-9

YES

Claims

NO

Industrial applicability (IA)

Claims 1-9

YES

Claims

NO

## 2. Citations and explanations (Rule 70.7)

D1 = DE-A-196 52 273

- 1). The present application relates to a method for producing 3-pentene nitrile from butadiene and hydrogen cyanate in the presence of a homogeneously dissolved Ni(0) catalyst stabilized by phosphorous ligands. It is characterized by a three-stage distillative processing of the reactor discharge: in the first stage, an overhead product high in butadiene is removed. In the second stage, a butadiene-containing overhead product is removed, a 3-pentene nitrile and 2-methyl-3-butene nitrile-containing product is removed laterally, and a catalyst-containing product is obtained as a bottom product. In the third stage, the product containing 3-pentene nitrile and 2-methyl-3-butene nitrile from the second stage is separated into its components.

- 2). The sole document cited in the search report that relates to the production of 3-pentene

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

nitrile indicates only that the reactor discharge is stripped of hydrocyanic acid and butadiene, and the liquid or solid discharge is processed "by distillation to separate out the end products and recover the ... catalyst" (see example 1). Therefore, the subject matter of present claim 1 is regarded as novel.

- 3). The problem to be solved by the present application is to separate non-reacted butadiene and catalyst from the 3-pentene nitrile and feed it back into the 3-pentene nitrile production process, thereby, however, feeding as little 2-methyl-3-butene nitrile back into the reactor as possible and having as little thereof as possible in the 3-pentene nitrile product, and also to cause as little thermal stress to the catalyst as possible. 3-pentene nitrile is used to produce adiponitrile. Since in this reaction any 2-methyl-3-butene nitrile already present is converted into methyl glutar nitrile, which is an undesirable impurity in the adiponitrile, the quantity thereof has to be kept as small as possible throughout the entire process for producing adiponitrile.
- 4). The claimed three-stage distillative processing should be an optimal solution for the problem to be solved. The lowest boiling butadiene can be fed back into the first

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2005/000774

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

stage without too much thermal stress on the catalyst; the difficult separation of the 3-pentene nitrile and 2-methyl-3-pentene nitrile, which boil at a similar temperature, is postponed until after the catalyst is separated out. In this way, the catalyst does not have to subject to thermal stress for very long and the possibility of an undesired catalyzed isomerization of the 3-pentene nitrile to form the undesired 2-methyl-3-pentene nitrile is limited. This process method and the advantages resulting therefrom cannot be derived from the mere indication of distillative processing according to D1, and therefore inventive step is acknowledged.